So as to determine the better method, a demonstration of a single motion sequence produced using each of these methods, with recordings made with a prototype format converter supplied by the ATTC, will be held during June 1990.[9]

The Ad Hoc Group on Production Planning, which was formed under the auspices of PS/WP-6, has estimated that the cost of producing the motion test sequences will be between $2 and $2.2 million, depending upon the method employed. It is anticipated that approximately $1.4 million of these total amounts will be obtained through the generous donation of equipment from members of the Ad Hoc Group. Nevertheless, a sizeable amount of cash -- the Ad Hoc Group estimates $800,000, and it could run as high as $1 million -- is still needed for professional services of various types to actually produce the test materials.

In addition to the camera-generated motion sequences, the Working Party has also concluded that some additional test materials will be produced by film-to-tape transfers in all four video formats. The film format that will comprise the bulk of these materials will be 35 mm, 24 fps, the same used today in television production.[10] It is also

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[9] A decision has already been rendered as to the reference picture material that will be employed, regardless of the production methodology. For the basic quality evaluations, the reference standard images will be in the SMPTE 240 M format. Impairment evaluations will be made using input source material recorded in the relevant format.

[10] As noted in the PS/WP-6 Chairman's Report, "Working

(continued...)

anticipated that some film-to-tape transfers in all four formats may be made from Showscan footage (65 mm, 60 fps film) via a special telecine constructed by Showscan Film Corporation and BTS under contract with Zenith.

PS/WP-6 has also determined that two types of observers will be involved in subjective evaluations. One type is "expert" viewers. A panel of five expert viewers will establish the threshold of appearance and the range (to "failure") over which observations of each impairment will be made.[11]

The second type of observer is "non expert" viewers. There will be many more of them than of the expert viewers, and they will rate their reactions to various levels of the impairments they are shown, as well as to basic quality of the (unimpaired) pictures they view.[12]

Finally, in a further effort to expedite the testing process without sacrificing the quality of the endeavor,

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[10](...continued)
Party 6 has already decided that the ATV test materials could not be primarily based upon film originals, in any format. However, there may be a place for the Showscan/telecine technique among the many sequences required."

[11] This will be done at the Test Center by viewing the performance of the ATV system under test. Then a video tape record will be made over the defined range. These expert viewers will also be the only ones to observe and comment on system performance to certain highly specialized kinds of impairment.

[12] All of this viewing will be done from video tape recordings, made through the format converter, of each system's performance.

PS/WP-6 has suggested that the number of subjective evaluations be minimized, at least initially. Under this concept, which is called "range recording only" (RRO), non-expert subjective evaluations of interference and other impairments would be limited to some eight impairments.[13] For the remaining impairments, thresholds and ranges would be determined, and master tapes created, but full subjective assessment of these impairments would be made by non-expert viewers only if needed to differentiate between or among surviving systems.[14]

G. Progress Report of Working Party 7: Audience Research

The four study designs suggested in the last WP-7 report were reformatted into four Requests for Proposals (RFPs) that were issued to the research community (PS/WP-7-0038). The goal of this exercise was not to select "winners" in the RFP process but to develop a set of research plans, complete with cost estimates and schedules, that had adequate specificity to serve the needs of the Advisory Committee. The RFP

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[13] Subjective assessments would also be made of all quality elements.

[14] A related matter, considered at the February 14, 1990, meeting of PS/WP-6, involved whether random sequences were required for the subjective evaluations. PS/WP-6 concluded that only two pseudo-random orderings (analyzed by experts to minimize any bias created by presentation order) are required for each test sequence. Thus, two master tapes will e produced with the only difference between them being the presentation order of test sequences.

materials made clear that: (1) No public funds were currently available to support the WP-7 research program; (2) any proposals submitted in response to the RFP process would be entered into the public record as an exhibit of WP-7's activities.

The responses to the RFPs were due by October 18, 1989 and over twenty proposals from more than a dozen different research organizations were received. WP-7 concluded that based on the low level of interest in tackling the third study (in-depth study) that it be put on hold for the time being; the primary reasons for this was the recognition that insufficient programming material exists for any long term viewing/exposure research. Three specialist groups were formed to review and respond to the remaining research proposals. Comprehensive summaries of the results are contained in the working party report; the condensed summaries from the report are presented here:

Summary of RFP-1 (TV Store Study)

Concept:	Investigate viewer comparisons and evaluations of NTSC, IDTV, and HDTV designed to generate a demand curve
Vendors:	Eight vendors submitted proposals
Costs:	Proposals range from $250,000 to $400,000 (includes most equipment, facilities and programming)
Timeline:	12-24 weeks to completion
Recommendation:	Proceed, current proposals present viable solutions.

Summary of RFP-2 (Technical Study)

Concept:	Assess viewers reactions to various ATV attributes (e.g., aspect ratio, progressive/interlace scanning, screen size)
Vendors:	Eight vendors submitted proposals, four asked to bid in second round, one of these vendors has since dropped out.
Costs:	Median cost is $178,000 (ranging from $50,000 to $6-7 million annually for 3 year program). Final costs need to be re-estimated if two phase approach is adopted.
Timeline:	Current proposals specify 2-36 month timelines. Subject to respecification.
Recommendations:	Adopt two phase approach: Phase I = NTSC versus 1125/aspect ratio; Phase II = interlaced versus progressive, resolution (525/787.5/1050), transmission degradation. Phase II can commence when specific equipment and programming becomes available (perhaps within 12 months).

Summary of RFP-4 (Advanced TV Study)

Concept:	Study the influence of developments not related to resolution may influence demand for ATV (e.g., interactivity)
Vendors:	Six vendors submitted proposals for this study, four of these have the greatest promise for achieving WP-7 goals.
Costs:	The current proposals range from $40,000 to $200,000. This price would be adjusted if the design is changed.
Timeline:	As specified, current proposals range from 32-52 weeks in length.
Recommendations:	Adopted recommended three phase approach, revised approaches proposed by four vendors.

Some of the research respondents expressed the need to receive some kind of support in securing the necessary facilities, equipment and programming for this research. Many of the respondents only tried to estimate their own direct research costs and not these indirect support costs. The expectation is that the hardware and facilities along with much of the stimulus programming can be donated or obtained very cost effectively. The entire research program, consisting of three separate studies (some multi phased) could take up to 36 months and up to $8 million to complete. It is likely that the program can be completed satisfactorily in 12 to 18 months for perhaps $850,000, including some in-kind support of equipment and programming.

PS/WP-7 was also tasked with coordinating with ATTC on research into audience reactions to letter box displays. WP-7 has reviewed and responded to the RFP on this research topic issued by the ATTC. Several members of the WP-7 also serve on ATTC bodies in various capacities, either on the board or on the ATTC Consumer Research Committee, so that there is excellent coordination between these two groups.

V. FURTHER WORK

From a review of progress made to date, it is apparent that further work is required in several areas. This section describes the work to be done.

A. Further Work of Working Parties 1: Technology Attributes and Assessment and 2: Testing and Evaluation Specifications

Insofar as the development of a scheme to assess dynamic resolution remains elusive, Working Parties 1 and 2 will be called upon to renew their efforts to develop testing specifications for this system attribute. In addition, both Working Parties will quickly develop attributes and specify the tests needed to characterize audio performance of ATV systems so that needed information can be provided to SS/WP-2 promptly. Finally, these Working Parties, in coordination with PS/WP-4 will begin work on the development of a field testing plan.

B. Further Work of Working Party 3: Spectrum Utilization and Alternatives

Based on previous assignments, work to be done, and not yet accomplished includes the following:

- Development of preliminary channel allotment plans and assignment options based on inputs from the System Subcommittee and WP-3 developed Planning Factors;
- Examination of the benefits of collocation of ATV transmitters;
- Development of the necessary tools to characterize interference between NTSC and ATV, and recommendation of mutual interference reduction measures, such as collocation.

- Complete work on identifying the availability of spectrum to support ATV broadcast auxiliary operations (including satellite, STL and ENG).

C. Further Work of Working Party 4: Alternative Media Technology and Broadcast Interface

PS/WP-4 will continue to monitor all ATV related work, find ways to extract interfacing information from ATV proponents, deliberate the issues and disseminate information whenever possible. In addition, PS/WP-4 will work with PS/WP-1 and 2 to ensure that the field test plan encompasses end-to-end testing of cable systems.

D. Further Work of Working Party 5: Economic Factors and Market Penetration

As its first priority, Working Party 5 is working toward development of a new set of projections of market penetrations based on scenarios involving different assumptions about the driving factors. Its objective is to develop a new family of market penetration projections in the first quarter of 1990, and a further joint meeting will be held with SS/WP-3 in the first quarter of 1990 to discuss the interim results.

PS/WP-5 recognizes that there are other economic issues concerning ATV of great interest and concern from the point of view of economic policy. These include the implications of ATV policies for industrial development and international trade. The Working Party's forthcoming work program will

review these issues and consider what contribution PS/WP-5 activities can make to an improved understanding of them.

E. Further Work of Working Party 6: Subjective Assessment

PS/WP-6 has several major assignments it intends to complete in the near future. The first is to revise and approve the still test material. The second task is to ensure that the source material demonstration is conducted, and, following a decision as to the manner in which the material will be produced, to conclude production of the dynamic source material and have it ready for testing no later than September 1, 1990. Finally, PS/WP-6 expects to examine both the telecine system to be used for transferring the 35 mm/24 fps film images to video tape and the high definition television cameras used in the production of motion sequence test material to ensure that the resulting image quality of these devices is state-of-the-art.

F. Further Work of Working Party 7: Audience Research

The members of Working Party 7 have a strong commitment to the recommended research program and are quite willing to pursue sources of funding in the next period of work.[15] Based on advice from Advisory Committee Chairman, Richard

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[15] Possibilities for financial support of this research program identified by PS/WP-7 are: 1) the Advisory Committee; 2) system proponents; and 3) other funding sources (e.g., foundations).

Wiley, and FCC Staff Liaison, David Siddall, Working Party 7 can under take its own activities to solicit funds on behalf of the FCC to support the research program. These activities must follow strict guidelines.[16] WP-7 is willing to undertake the development of a financial plan pursuant to these guidelines. WP-7 will also continue to coordinate with the ATTC on the letter box study.

VI. SPECIAL ISSUES FOR THE ATTENTION OF THE ADVISORY COMMITTEE

As the discussion above indicates, much progress has been made in the Working Parties which comprise the Planning Subcommittee. There are, however, a number of matters which have arisen in the work of WPs 3, 6, and 7 upon which the Advisory Committee's guidance or concurrence is highly desirable. These matters must be addressed now if the Committee's work is to proceed in an orderly and efficient fashion.

A. Subjective Assessment Issues

1. Source Materials Issues

a. Production

Prior to the initiation of testing on ATV proponent

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[16] See FCC Directive (FCCINST 1126.1), effective date of May 10, 1988, regarding Federal Advisory Committees seeking private funding (pp. 10-11).

systems, appropriate video test materials must be produced.[17] Before the material can be produced, however, decisions must be made regarding the funding of the production effort and the production method to be employed. Testing will not be conducted unless and until judgments are reached on these two critical issues.

The types of video material required have been specified and two general approaches to producing the material have been identified:[18] 1) The production of "identical" picture materials in four distinct scanning formats using the BTS KCH-1000 multiscan camera; and 2) The production of "identical" picture material in two scanning formats, with images in the remaining formats derived via a standards converter. A comparison between video material generated using these two production methods is planned for June 1990.

As indicated above, it is estimated that the unfunded portion of producing the motion sequence test material will be in neighborhood of $800,000. There appear to be only

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[17] At this juncture, no audio test material has been recommended or prepared. As was reported in the PS/WP-6 Chairman's Report, "no psychoacoustic [audio] tests are planned at this time, even if a complete system is presented to the ATTC for test...It has been conjectured that these ATV systems may be of such excellent quality that psychoacoustic tests may never become necessary..." See, "Third Interim Report of the Chairman, Planning Subcommittee Working Party 6, FCC Advisory Committee on Advanced Television Service," Submitted by Bronwen L. Jones, Chairman and Craig K. Tanner, Vice Chairman, January 1990, ("PS/WP-6 Chairman's Report") at p. 21.

[18] Each methodology also includes the production of material via electronic graphics and film transfer.

three real options for addressing the source material funding issue, as follows:[19]

1. Obtain necessary funds from some or all of the system proponents;

2. Obtain necessary funds from the Advisory Committee via a mandatory or voluntary assessment of Committee members;

3. Obtain necessary funds from the Federal Government and/or private foundations.

Options 1 and 2 appear to be the best near term methods for obtaining the required funds. The pursuit of government or foundation funds (Option 3) would likely prove futile, but even if funds could be made available, serious timing problems are presented. Even DARPA has been slow in funding those institutions it has identified for support. Thus, under the most optimistic scenario any money obtained in this manner would not be available for at least a year. Testing would then not begin until the beginning of 1992, at the absolute earliest. Such a delay would put the Advisory Committee's work well beyond its present lifetime and would also strain the resources of the sponsors of both the Advanced Television Test Center and the Cable Television Laboratories.

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[19] In the opinion of the Planning Subcommittee Chairman, any attempt to dispense with motion sequence test materials would be unacceptable. Many of the proponent systems rely heavily on video compression techniques to provide improved resolution under the bandwidth constraints imposed by the FCC. Without some way of assessing the motion artifacts which may result from those techniques, it will be impossible to reach a rational conclusion on a standard.

On balance, the Planning Subcommittee Chairman recommends that the Committee endorse Option 1 -- obtaining funding from some or all of the proponents.[20] Many firms and companies without a direct financial stake in this process are already spending significant amounts on this endeavor through support of the Advanced Television Test Center and the Cable Labs. The proponents have the most to gain from this process, and therefore are logical candidates for supporting it. Moreover, the level of funding is extremely modest compared to the investment most of the proponents have made, and will continue to make, in developing their systems.

If funding is identified to permit the production of source materials, a decision must be made with regard to production method employed. As indicated above, two general approaches have been identified, and a comparison of the two is planned for June 1990. As things now stand, PS/WP-6 is prepared to assess the results of that comparison and attempt to make a recommendation as to which to employ. In the event that a consensus on the matter is not achieved, some alternative decision-making scheme must be employed.

One alternative would be to refer the question to the parent Advisory Committee. This is not a practical solution, however, because of the need to reach a decision quickly to

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[20] The same option has been recommended by the Advisory Committee Chairman. See, letter to proponents from Richard E. Wiley, Chairman of the Advisory Committee on Advanced Television Service, February 7, 1989 ("Chairman's proponent letter").

permit the production of materials and the commencement of testing by early in the Fall of 1990. Therefore, the Planning Subcommittee Chairman recommends that, in the event that PS/WP-6 is unable to reach a decision as to which production method to employ, the matter be referred to the Steering Committee of the full Advisory Committee for its resolution at the earliest possible date.[21]

b. Distribution

The issue of whether, and under what conditions, source materials produced under the auspices of the Advisory Committee could be accessed by proponents (and other entities, presumably) was raised in a meeting of the Systems Subcommittee.[22] The consensus of the persons attending that meeting was that all source material should be made available to proponents.

PS/WP-6 subsequently considered the issue and reached different conclusions as follows:

> Working Party 6, in its meeting of December 6, 1989, unanimously agreed upon the following recommendations regarding the proponents' access to the test materials:
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> 1. No recordings of the subjective test materials, either complete or partial, should be distributed to the ATV system proponent organizations in advance of the start of testing.

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[21] The Steering Committee is composed of the Committee and Subcommittee Chairs and Vice Chairs.

[22] See, draft minutes of Eighth Meeting of the Systems Subcommittee, November 28, 1989.

2. Upon completion of production of the full set of test materials, both still and motion, Working Party 6 will conduct a meeting to which all proponents will be invited. The full set of test materials will be screened for the proponents, who will be permitted to take notes, but will not be permitted to make recordings of any kind.[23]

PS/WP-6 outlined several advantages to this policy regarding access to source material:

1. Eliminate the delay in testing that would result from advance distribution of test materials to proponents. Testing can begin immediately upon completion of the test materials without waiting an additional 60 or 90 days as required by "advance" distribution of materials.

2. Eliminate the unfairness that could result from distributing test reels to all proponents when only some will have the financial resources to access [the PIXAR unit,] the digital VTR and [the digital] format converter needed for their playback.

3. Eliminate the unfairness that could result from distribution of test materials to proponents with more than one ATV system for submission. For example, if distribution were permitted, a proponent with two ATV systems might receive test materials, say, 60 days before testing of his first system, but would then have the materials in hand many more months in advance of testing of his second system.[24]

4. Eliminate the need to prepare special test materials similar to, but not exactly matching, the actual test materials, or preservation of outtakes. This had been suggested as a way of distributing materials useful to the proponents but without compromising the value of the actual test materials. The Working Party believes that the funding shortfall and schedule for production of the actual set of test materials is such that the

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23 PS/WP-6 Chairman's Report at p. 19.

24 Of course, even proponents offering a single system that were tested later in the process could gain an advantage by having access to the test materials prior to the start of the entire testing program.

stress of additional production and/or editing must be avoided.[25]

The Planning Subcommittee Chairman shares the concern expressed by PS/WP-6 on the issue of source material distribution.[26] In addition, the Chairman is of the opinion that making these materials available to proponents prior to testing would create significant administrative problems (copying, recordkeeping, managing unauthorized distribution, etc.) which heretofore neither the Advisory Committee nor any other entity has been prepared to assume. Thus, the PS Chair concurs in PS/WP-6's recommended policy on the matter and urges the Advisory Committee to endorse it, as well.[27]

Because the production and editing of the motion sequence test materials is under the auspices of the Advisory Committee, it will be able to exercise total control over the distribution of these materials.[28] The "still" test images, however, are the property of either Eastman Kodak or the

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25 PS/WP-6 Chairman's Report, supra.

26 The Advisory Committee Chairman also recommends adherence to the policy adopted by PS/WP-6. See, Chairman's proponent letter.

27 PS/WP-6 also expressed concern regarding the announced intention of other organizations to conduct subjective assessments of advanced television systems. To avoid any confusion which could arise from conflicting results, the Working Party expressed a desire to distinguish these other efforts from those of the Advisory Committee. Adherence to the policies articulated above should help in this regard.

28 Under the conditions described above, the ATTC has offered to act as custodian of these materials.

National Aeronautics and Space Administration. Members of the Planning Subcommittee are now coordinating an agreement with both these institutions to ensure that, for the testing period, the photographic source of the "still" images will be shared only with the Advisory Committee and ATTC.

2. Tests

a. "Range Recording Only" (RRO) Tests

As described above, PS/WP-6 has suggested that, without sacrificing the quality of test results, the time and money expended on subjective testing may be reduced if the number of impairments subjected to the full range of non-expert evaluations is limited. Under this approach, thresholds and ranges would be determined, and master tapes made, for all impairments, but non-expert viewers would assess only a few (eight of 27).

Systems would be ranked initially using all subjective and objective test data (including ranges and thresholds). Only if additional information were needed to further distinguish among systems, would the remaining impairments be subjectively evaluated.

The PS Chair favors this approach and recommends that the Advisory Committee endorse it. The PS Chair also suggests that decisions regarding the need for subsequent rounds of subjective testing be addressed in Working Party 4 of the System Subcommittee (SS/WP-4 ATS Standard).

b. Canadian Involvement

The Canadian Advanced Broadcast Systems Committee (CABSC) has generously offered to devote the resources of the Communications Research Centre (CRC) to assist the Advisory Committee in conducting the psychophysical tests of advanced television systems. A joint working arrangement with the CABSC could offer two important benefits.

First, because the CABSC and the CRC have engaged in this type of research before, this joint arrangement would bring valuable experience and expertise to the subjective testing portion of the Advisory Committee's work. Second, the involvement of a respected Canadian organization would help ensure the development of a North American broadcast ATV standard, thereby encouraging the adoption of the same standard in all other countries of the world where NTSC is in use today. Such a result could have positive economic implications for U.S. program producers and equipment manufacturers.

As proposed, the CABSC/CRC would conduct the psychophysical tests in strict accordance with the test plans developed by the Advisory Committee. Although it is envisioned that much of the actual tests would be performed in Canada, CABSC/CRC representatives have suggested that a portion of the tests could be conducted in the United States to ensure the robustness of the results.

It is evident that there are important benefits in conducting the subjective tests jointly, and the PS Chair encourages further discussion between the parties. It would seem to be in the interests of both parties, however, if each had a significant presence in all aspects of these tests. Thus, it is suggested that, at a minimum, the terms of the joint agreement require a significant portion of the various tests be conducted in each country under joint supervision.

If such terms can be developed, it is the recommendation of the Planning Subcommittee Chairman that the Advisory Committee accept the CABSC's offer. It is also recommended that authority to coordinate the necessary arrangements between the two institutions be delegated to the Advisory Committee Chairman.

c. Multiple Displays

PS/WP-6 is in receipt of a letter from one of the proponents requesting modification of the subjective test procedures to require the use of two video monitors: one which would be employed for the evaluation of enhanced NTSC video systems, the other would be used for the evaluation of HDTV systems.[29] The proponent argues that the use of a single, high resolution display, with its lower brightness and limited spot size adjustment range, could bias the

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[29] See, letter from James E. Carnes to Bronwen L. Jones, January 12, 1990.

results of the basic received picture quality test to the disadvantage of enhanced NTSC systems.

Although the test procedures have been under development for nearly a year, this issue had not been presented to either the Advisory Committee or the ATTC prior to the proponent's letter. The topic has now been discussed extensively by the Planning Subcommittee Chair, ATTC staff and members of both PS/WP-6 and SS/WP-2. While recognizing the arguments advanced by proponents, the view expressed by parties to these discussions is that a single standard test setup, including a single ATV monitor, is absolutely necessary to ensure that the systems themselves are evaluated, not the equipment used to assess those systems. It is the view of the Planning Subcommittee Chairman that the Advisory Committee should endorse this policy and deny the proponent's request to modify the subjective test procedures.

d. Expert Panel

Before subjective tests employing non-expert viewers can be performed, the impairment threshold and range must be established for each system tested. PS/WP-6 recommends that these determinations be developed by a panel composed of five "expert" viewers. This panel would also be solely

responsible for evaluating system performance to a small set of other impairments identified by PS/WP-6.[30]

It is evident that the panel would be assigned a substantial amount of work and a good deal of responsibility. Inasmuch as PS/WP-6 has not yet identified individuals to participate as members of this "expert panel," the Planning Subcommittee Chairman suggests that perhaps the best candidates for at least half the viewers on this panel may be senior engineers on the staff of the Federal Communications Commission.[31] Many of these individuals have participated previously in the evaluation of impairment to television reception and, therefore, have both the expertise and the experience to perform these very critical tasks.

e. Audio Quality Tests

In the Advisory Committee's Second Interim Report, the Commission was asked to address whether proponent ATV systems should contain some minimum number of high quality audio channels. In a letter to the Advisory Committee, the Commission declined to make such a determination, but did make the following observations:

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[30] These other potential impairments are: video cuts, video peaking and image enhancement, camera unsteadiness, conditional access systems, and subjective resolution.

[31] The other three viewers could be drawn from a pool of volunteers, composed of qualified video technicians and engineers from the private sector.

> In examining the quality improvements presented by the various ATV transmission schemes, the Commission will likely assess both video and audio performance. The Committee should assist us in this regard by ensuring that tests of these systems will develop data on audio performance, including cross talk between analog and digital channels. Thus, system proponents would be well advised to emphasize the audio component of their systems sufficiently so as to both maintain service to NTSC receivers and deliver the high quality we anticipate from ATV systems.
>
> Beyond the basic requirement that the quality of the ATV system ultimately selected by the Commission be higher than that of an NTSC system, the Commission does not specify any minimum number of audio channels at this juncture. Because the testing process is fundamentally a comparison of competing ATV systems, the number and quality of each system's audio channels will likely be among the significant comparative factors that will help in ranking these systems. This likelihood should motivate proponents to provide a high quality digital audio signal in their systems even in the absence of standards for minimum numbers of audio channels.[32]

The Planning Subcommittee Chairman wishes to direct the attention of the Advisory Committee to the fact that, at present, there are no provisions for audio quality testing in the test plans. In many respects, of course, this is a result of the Commission's decision to not establish an audio quality "floor." System proponents have simply deferred development of this portion of the television transmission system. Nevertheless, no means currently exist to comply with the Commission's wishes as described above. Therefore, it is highly recommended that, prior to making a final

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[32] Letter from Dennis R. Patrick, Chairman, Federal Communications Commission, to Richard E. Wiley, July 18, 1989, emphasis added.

decision on transmission standards, the audio portion of finalist systems be fully evaluated.

f. Dynamic Resolution Test Methodology

PS/WP-2 has specified a methodology to test systems' dynamic resolution -- that is, the resolution exhibited in response to motion sequences. The scheme is based on the use of a set of dynamic sequences such as a rotating sun burst pattern, and resolution is assessed along each of three axis (horizontal, vertical and diagonal).

Apparently the Systems Subcommittee Working Party 2 (SS/WP-2 ATS Evaluation and Testing) has received comments from some proponents opposing the test method defined by PS/WP-2. SS/WP-2 has requested assistance in developing an alternative test methodology from the IEEE Test and Measurements Standards Committee, but this Committee has not yet met to resolve the issue.

It is of utmost importance that procedures be developed to test this critical ATV attribute. The Advisory Committee is urged to take whatever actions are necessary to ensure that test plans are developed in a timely fashion.

B. Refinement of Test Methodology if Augmentation Systems Are Not Tested

The December 31, 1989, technical submissions to SS/WP-1 by all system proponents, and the subsequent announcement by David Sarnoff Research Center, NBC, Philips and Thomson

Consumer Electronics to form a consortium to pursue the development of enhanced and simulcast advanced television systems, reveal that there may be no augmentation systems currently scheduled for test. If this circumstance remains true, the test plans will need to be refined to delete those tests which relate solely to the augmentation approach.

C. Spectrum Issues

Working Party 3 of the Planning Subcommittee (PS/WP-3) has tentatively concluded that establishment of final planning factors must await the interference and coverage data to be developed in the testing program. Nevertheless, sufficient information is available now to create a series of possible allotment and assignment plans that would offer insights into the tradeoffs posed by various spectrum options. The possible early resolution of some spectrum issues would speed implementation of ATV service.

Concurrence by the Advisory Committee on this project is important for two reasons. First, because this work will require a substantial commitment of resources (already generously offered by broadcast members of the Advanced Television Systems Committee), it should not be undertaken without the complete support and endorsement by the Committee. Second, concurrence by the Committee would signify an endorsement of the proposition that detailed

allotment and assignment studies should not be deferred until standards have been established.

D. Field Tests

The Advisory Committee should also be notified that no provision has yet been made for the running of field tests on ATV transmission systems. Nevertheless, before a final recommendation can be made on an ATV standard, field tests must be performed on at least a small number of "finalist" systems. Because preparation for these tests can be time-consuming, in order to ensure a timely completion of these tests, the Planning System Chair recommends that test procedures and other preparatory activity commence immediately.

E. Audience Tests

Working Party 7 has made a substantial effort in designing a plan of study to ascertain consumer reaction to different aspects of advanced television. It has also developed reasonably solid estimates of the cost and time required for these studies. The Committee must now decide whether some, all, or none this research should be undertaken, and if so, how the projects should be ranked, when work should commence, and how it will be funded. With regard to the issue of financing, PS/WP-7 has identified three possible sources: 1) the Advisory Committee; 2)